

TESTIMONY FOR THE RECORD

**SUBMITTED BY
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**BEFORE THE
SUBCOMMITTEE ON ENERGY AND RESOURCES
COMMITTEE ON GOVERNMENT REFORM
UNITED STATES HOUSE OF REPRESENTATIVES**

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Chairman Issa, Ranking Member Watson and distinguished members of the subcommittee, I am Marvin Fertel, senior vice president and chief nuclear officer at the Nuclear Energy Institute (NEI). NEI appreciates the opportunity to provide this testimony for the record on the role of nuclear energy in U.S. energy policy, on the value of our 103 operating nuclear power plants, and on the strategic importance of building new nuclear power plants in the years ahead.

NEI is responsible for developing policy for the U.S. nuclear industry. Our organization's 250 member companies represent a broad spectrum of interests, including every U.S. energy company that operates a nuclear power plant. NEI's membership also includes nuclear fuel cycle companies, suppliers, engineering and consulting firms, national research laboratories, manufacturers of radiopharmaceuticals, universities, labor unions and law firms.

America's nuclear power plants are the most efficient and reliable in the world. Nuclear energy is the largest source of emission-free electricity in the United States and our nation's second largest source of electricity after coal. Nuclear power plants in 31 states provide electricity for one of every five U.S. homes and businesses. Eight out of 10 Americans believe nuclear energy should play an important role in the country's energy future.¹

Given these facts and the strategic importance of nuclear energy to our nation's energy security and economic growth, NEI encourages Congress to maintain policies that ensure continued operation of our nation's nuclear plants, and to provide the impetus required to expand emission-free nuclear energy as a vital part of our nation's diverse energy mix.

¹ Bisconti Research Inc./NOP World, October 2004, 1,000 U.S. adults

Last week, the U.S. House of Representatives demonstrated strong support for nuclear energy's role with passage of comprehensive energy policy legislation, H.R. 6. That legislation includes a number of major policy initiatives necessary to carry this technology forward into the 21st century as a major contributor to U.S. electricity supply. Provisions supporting nuclear energy include renewal of the Price-Anderson insurance framework, which provides immediate coverage to the public in the case of nuclear reactor incident; an expanded research and development portfolio; support for universities; and updated tax treatment of nuclear decommissioning funds to reflect today's competitive electricity business.

NEI's testimony for the record will address three major areas:

1. America's nuclear power plants have a strategic value as a source of safe, reliable, clean electricity at stable prices.
2. Industry initiatives to ensure continued operation of today's nuclear plants at sustained, high levels of performance, and to prepare for construction of new nuclear power plants.
3. The importance of strong congressional oversight to ensure effective and efficient implementation of the federal government's nuclear energy programs, and to maintain America's leadership in nuclear technology development and its influence over important diplomatic initiatives like nonproliferation.

THE STRATEGIC VALUE OF NUCLEAR ENERGY

The United States has 103 nuclear reactors operating today. Nuclear power represented 20 percent of U.S. electricity supply 10 years ago, and it represents 20 percent of our electricity supply today, even though we have six fewer reactors than a decade ago and total U.S. electricity supply has increased by 25 percent in the period.

Nuclear power has maintained its market share thanks to dramatic improvements in reliability, safety, productivity and management of our nuclear plants, which today operate, at an average 90 percent capacity factor, year in and year out. Improved productivity at our nuclear plants satisfied 20 percent of the growth in electricity demand over the last decade.

The increase in output from U.S. nuclear plants in the past 10 years—from 640 billion kilowatt-hours in 1994 to 789 billion kilowatt-hours in 2004—is approximately equivalent to

bringing 18 new 1,000-megawatt power plants (operating at a 90 percent capacity factor) into service.

Nuclear energy serves a number of important national needs.

First, nuclear power plants contribute to the fuel and technology diversity that is the core strength of the U.S. electric supply system. This diversity is at risk because today's business environment and market conditions in the electric sector make investment in large, new capital-intensive technologies difficult, particularly in the advanced nuclear power plants and advanced coal-fired power plants best suited to supply baseload electricity. More than 90 percent of all new electric generating capacity added over the past five years is fueled with natural gas. Natural gas has many desirable characteristics and should be part of our fuel mix, but over-reliance on any one fuel source leaves consumers vulnerable to price spikes and supply disruptions.

Second, nuclear power plants provide future price stability that is not available from electric generating plants fueled with natural gas. Intense volatility in natural gas prices over the last several years is likely to continue, thanks partly to unsustainable demand for natural gas from the electric sector, and such price volatility subjects the U.S. economy to potential damage. The operating costs of nuclear power plants are stable and can dampen volatility of consumer costs in the electricity market.

Third, nuclear plants reduce the pressure on natural gas supply, thereby relieving cost pressures on other users of natural gas that have no alternative fuel source.

Fourth, nuclear power plants play a strategic role in meeting U.S. clean-air goals and the nation's goal of reducing greenhouse gas emissions. Nuclear power plants produce electricity that otherwise would be supplied by oil-, gas- or coal-fired generating capacity, and thus avoid the emissions associated with that fossil-fueled capacity.

The emissions avoided by U.S. nuclear power plants are essential in meeting clean-air regulations. In 2003, U.S. nuclear power plants avoided the emission of about 3.4 million tons of sulfur dioxide (SO₂) and about 1.2 million tons of nitrogen oxide (NO_x). To put these numbers in perspective, the requirements imposed by the 1990 Clean Air Act amendments reduced SO₂ emissions from the electric power sector between 1990 and 2001 by about 5 million tons per year and NO_x emissions by about 2 million tons year.² Thus, in a single year, nuclear

² "EPA Acid Rain Program: 2001 Progress Report," U.S. Environmental Protection Agency, November 2002.

power plants avoid nearly as much in emissions as was reduced over an 11-year period by other sources.

The NO_x emissions avoided by U.S. nuclear plants are equivalent to eliminating NO_x emissions from six out of 10 passenger cars in the United States. The carbon emissions avoided by U.S. nuclear power plants are equivalent to eliminating the carbon emissions from nine out of 10 passenger cars in the United States. Without our nuclear power plants, greenhouse gas emissions from the electric power sector (which represents approximately one-third of U.S. greenhouse gas emissions) would be approximately 30 percent higher

Finally, nuclear energy is a secure domestic source of energy, and the United States is not alone in recognizing its importance to national security. The decision to employ nuclear power as a major energy source in countries such as France and Japan was based on energy security. The governments of both countries recognize that nuclear energy would protect their nations' energy supplies from disruptions resulting from political instability and protect consumers from price fluctuations resulting from market volatility. Today, France depends on nuclear energy to meet more than three-quarters of its electricity demand, and Japan for more than one-quarter.

Despite the strong international commitment to nuclear power, evidenced by the 26 nuclear reactors under construction today around the world, the U.S. nuclear energy sector remains by far the world's largest in terms of electricity production—larger than the nuclear sectors of France and Japan combined.

In summary, nuclear energy represents a unique value proposition. Nuclear power plants provide large volumes of electricity—cleanly, reliably, safely and affordably. They provide future price stability and serve as a hedge against price and supply volatility. Nuclear plants have valuable environmental attributes. And they help preserve our nation's energy security. These characteristics demonstrate why nuclear energy has such strategic importance in U.S. energy policy.

Thanks to excellent plant performance and growing awareness of nuclear energy's benefits, public support for nuclear energy is at an all-time high. The industry has monitored public opinion closely since the early 1980s, and two key trends are clear: First, public favorability to nuclear energy has never been higher. Second, the spread between those who support the use of nuclear energy and those opposed is widening steadily—80 percent of Americans think nuclear power is important for our energy future, and 67 percent favor the use

of nuclear energy. Seventy-one percent favor keeping the option to build more nuclear power plants. Six in 10 Americans agree that “we should definitely build more nuclear power plants in the future.” And 62 percent said it would be acceptable to build new plants next to a nuclear power plant already operating.³

INDUSTRY INITIATIVES TO INCREASE NUCLEAR ENERGY PRODUCTION AND PREPARE FOR NEW NUCLEAR POWER PLANT CONSTRUCTION

The 103 operating nuclear plants are such valuable electric generating assets that virtually all companies are planning to renew the operating licenses for these plants, as allowed by law and Nuclear Regulatory Commission regulations, and operate for an additional 20 years beyond their initial 40-year license terms. Seventy U.S. reactors have now renewed their licenses, filed their formal applications, or indicated to the NRC that they intend to do so. We believe that virtually all U.S. nuclear plants will renew their licenses and operate for an additional 20 years.

In order to maintain safety and reliability, and to prepare the plants for an additional 20 years of operation, the industry is investing substantial sums in large capital improvement projects, including installation of new steam generators, new reactor vessel heads and other modifications to increase plant generating capacity.

These capital improvement projects position the plants for many years of operation in the future at high levels of reliability and safety, and they demonstrate the industry’s commitment to making the capital investments necessary to maintain safety and reliability.

Although it has not yet started to build new nuclear plants, the industry continues to achieve small but steady increases in generating capacity—either through power uprates or the restart of shutdown nuclear capacity. An uprate increases the flow of steam from the nuclear reactor to the turbine-generator so that the plant can produce more electricity. Uprates can increase a plant’s capacity up to 20 percent, depending on plant design and how much capital a company is prepared to invest. Over the past several years, the NRC has authorized power uprates that represent approximately 2,000 megawatts of additional generating capacity. Over the next five years, the NRC anticipates that companies will apply for approximately 30 power uprates, which could add an additional 2,000 megawatts of new capacity.

³ Bisconti Research Inc./NOP World, October 2004, 1,000 U.S. adults.

In addition, the Tennessee Valley Authority is restarting Unit 1 at its Browns Ferry site in northern Alabama. This is a very complex project—fully as challenging as building a new nuclear plant—and it is on schedule and within budget at the midpoint of the project.

However, there are obviously limits on how much additional electricity output the existing 103 nuclear power plants can produce. Meeting the nation’s growing demand for electricity—which will require between 229,000 megawatts and 334,000 MW by 2025, depending on assumptions about electricity demand growth—will require construction of many new nuclear power plants in the years ahead.⁴

The factors that make operating nuclear power plants a strategic national asset also justify a systematic, disciplined program to build new nuclear power plants in the years ahead to help meet growth in electricity demand. New nuclear plants would provide Americans with low-cost, safe and reliable electricity; bring long-term price stability to electricity markets; and prevent emission of air pollutants and greenhouse gases. In addition, new nuclear plant construction would create thousands of skilled, high-tech jobs—to design and build the plants, manufacture the equipment and fuel, and operate the plants when built. A program of new nuclear plant construction would maintain U.S. technological leadership in this high-tech field.

The nuclear energy industry and the Department of Energy launched a program several years ago that will position the industry to build new nuclear capacity when it is needed, by creating the business conditions under which companies can order new nuclear plants.

This is a comprehensive program designed to address the business issues—including licensing and regulatory issues, development of new plant designs, and financing—that could be roadblocks to new nuclear plant construction.

The United States has a new licensing process created by the 1992 Energy Policy Act. Under this process, we obtain all necessary regulatory approvals from the NRC before significant capital is committed. Sites can be approved in advance. Reactor designs can be approved in advance. And new nuclear plants will receive a single license for construction and operation—not the separate proceedings that created excessive delay in the period between construction and operation of many of today’s plants.

This approach should limit the regulatory risks that impacted the construction and licensing of many of our operating plants. This process also allows meaningful input from the

⁴ “Annual Energy Outlook 2005,” Energy Information Administration.

public and other stakeholders early on, before the plant is built, at a time when such input can influence plant design and licensing issues. This should avoid the costly delays common to the old way of licensing a nuclear plant. Because the old licensing process was a two-step process and did not require all the design and engineering to be complete when the construction permit was issued, it often resulted in extensive public hearings and public input after the plant was built and before it was allowed to operate.

The industry is now in the process of validating this new licensing process. In 2003, three companies—Dominion, Exelon and Entergy—initiated a three-year effort to obtain NRC approval for early site permits. Basically, the companies will be “banking” those sites for possible future use, deferring their decision to build reactors until later.

Three industry consortia, consisting of 16 energy companies, construction firms, architect/engineers, fuel companies and equipment suppliers, have responded to a DOE request for proposals to share the cost of obtaining a combined construction/operating license (COL). (Obtaining a COL will require a substantial investment of design and engineering work on new nuclear reactor designs.)

The design, engineering and licensing work that must be completed before new nuclear plants can be built and ordered is a substantial investment. It will cost \$400 million to \$500 million to complete the licensing demonstrations and the first-of-a-kind design and engineering for one reactor design. The industry would expect to share that cost with the federal government under DOE’s Nuclear Power 2010 program. The private sector would therefore commit the equivalent of \$200 million to \$250 million to the effort. To carry two new designs forward, the private sector commitment would be \$400 million to \$500 million.

It is critically important, therefore, that the government provide adequate funding for the DOE Nuclear Power 2010 program.

The overall objective for this industry initiative is to ensure new nuclear plants can be operational between 2010 and 2020. This will require an aggressive program of design, engineering and licensing work that must be completed before companies can place orders and invest in construction.

At that time, three factors—growth in electricity demand, increasingly stringent environmental controls on coal-fired and gas-fired generating capacity, and continued pressure

on natural gas supply and prices—will make construction of new nuclear generation an imperative.

THE IMPORTANCE OF STRONG CONGRESSIONAL OVERSIGHT

Industry and government will be prepared to meet the demand for new emission-free baseload nuclear plants in the 2010 to 2020 time frame only through a sustained focus on the necessary programs and policies between now and then.

As it has in the past, strong Congressional oversight will be necessary to ensure effective and efficient implementation of the federal government's nuclear energy programs, and to maintain America's leadership in nuclear technology development and its influence over important diplomatic initiatives like nonproliferation. Such efforts have provided a dramatic contribution to global security, as evidenced by the U.S.-Russian nonproliferation agreement to recycle weapons-grade material from Russia for use in American reactors. Currently, more than 50 percent of U.S. nuclear power plant fuel depends on converted Russian warhead material.

Nowhere is continued congressional oversight more important than with DOE's program to manage the used nuclear fuel from our nuclear power plants.

Continued progress toward a federal used nuclear fuel repository is necessary to support nuclear energy's vital role in a comprehensive national energy policy and to support the remediation of DOE defense sites.

Since enactment of the 1982 Nuclear Waste Policy Act, DOE's federal repository program has repeatedly overcome challenges, and challenges remain before the Yucca Mountain facility can begin operation. But as we address these issues, it is important to keep the overall progress of the program in context.

- There is international scientific consensus that a deep geologic repository is the best solution for long-term disposition of used military and commercial nuclear power plant fuel and high-level radioactive byproducts.
- The Bush administration and Congress, with bipartisan support, affirmed the suitability of Yucca Mountain for a repository in 2002. Over the past three years, the Energy Department and its contractors have made considerable progress providing yet greater

confirmation that this is the correct course of action and that Yucca Mountain is an appropriate site for a national repository.

- During the past year, federal courts have rejected significant legal challenges by the state of Nevada and others to the Nuclear Waste Policy Act and the 2002 Yucca Mountain site suitability determination. These challenges questioned the constitutionality of the Yucca Mountain Development Act and DOE's repository system, which incorporates both natural and engineered barriers to contain radioactive material safely.

In the coming year, Congress will play an essential role in keeping this program on schedule, by taking the steps necessary to provide increased funding for the project in fiscal 2006 and in future years.

Meeting DOE's schedule for initial repository operation requires certainty in funding for the program. This is particularly critical in view of projected annual expenditures that will exceed \$1 billion beginning in fiscal 2007. Meeting these budget requirements calls for a change in how Congress provides funds to the project from monies collected for the Nuclear Waste Fund. The history of Yucca Mountain funding is evidence that the current funding approach must be modified.

Consumer fees (including interest) committed to the Nuclear Waste Fund since its formation in 1983 total more than \$24 billion. Consumers are projected to pay between \$750 million to \$800 million to the fund each year, based on electricity generated at the nation's 103 reactors. This is more than \$2 million per day. Although about \$8 billion has been used for the program, the balance in the fund is nearly \$17 billion. In each of the past several years, there has been a gap between the annual fees paid by consumers of electricity from nuclear power plants and disbursements from the fund for use by DOE at Yucca Mountain.

Since the fund was first established, billions of dollars paid by consumers of electricity from nuclear power plants to the Nuclear Waste Fund—intended solely for the federal government's used fuel program—in effect have been used to decrease budget deficits or increase surpluses.

The industry believes that Congress should change the funding mechanism for Yucca Mountain so that payments to the Nuclear Waste Fund can be used only for the project and be excluded from traditional congressional budget caps. Although the program should remain

subject to congressional oversight, Yucca Mountain appropriations should not compete each year for funding with unrelated programs when Congress directed a dedicated funding stream for the project.

The industry also believes that it is appropriate and necessary to consider an alternative perspective on the Yucca Mountain project. This alternative would include an extended period for monitoring operation of the repository for up to 300 years after spent fuel is first placed underground. The industry believes that this approach would provide ongoing assurance and greater confidence that the repository is performing as designed, that public safety is assured, and that the environment is protected. It would also permit DOE to apply evolving innovative technologies at the repository.

Through this approach, a scientific monitoring program would identify additional scientific information that can be used in repository performance models. The project then could update the models, and make modifications in design and operations as appropriate.

Congressional committees like this one can help ensure that DOE does not lose sight of its responsibility for used nuclear fuel management and disposal, as stated by Congress in the Nuclear Waste Policy Act of 1982. The industry fully supports the fundamental need for a repository so that used nuclear fuel and the byproducts of the nation's nuclear weapons program are securely managed in an underground, specially designed facility. World-class science has demonstrated that Yucca Mountain is the best site for that facility. A public works project of this magnitude will inevitably face challenges. Yet, none is insurmountable. DOE and its contractors have made significant progress on the project and will continue to do so as the project enters the licensing phase.

Congressional oversight also can play a key role in maintaining and encouraging the stability of the NRC's regulatory process. Such stability is essential for our 103 operating nuclear plants and equally critical in licensing new nuclear power plants.

Congress played a key role several years ago in encouraging the NRC to move toward a new oversight process for the nation's nuclear plants, based on quantitative performance indicators and safety significance. Today's reactor oversight process is designed to focus industry and NRC resources on equipment, components and operational issues that have the greatest importance to, and impact on, safety.

The need for regulatory stability is particularly acute today in the area of nuclear plant security.

The NRC and the industry have worked hard to identify and implement realistic security requirements at nuclear power plants. In the three-and-a-half years since 9/11, the NRC has issued a series of requirements to increase security and enhance training for security programs. The industry complied—fully and rapidly.

In the days and months following Sept. 11, quick action was required. Orders that implemented needed changes quickly were necessary. Now, we should return to the orderly process of regulating through regulations.

The industry has spent more than \$1 billion enhancing security since September 2001. We've identified and fixed vulnerabilities. Today, the industry is at the practical limit of what private industry can do to secure our facilities against the terrorist threat. NRC Chairman Nils Diaz and other commissioners have said that the industry has achieved just about everything that can be reasonably achieved by a civilian force.

The industry now needs a transition period to stabilize the new security requirements. We need time to incorporate these dramatic changes into our operations and emergency planning programs and to train our employees to the high standards of our industry—and to the appropriately high expectations of the NRC.

Both industry and the NRC need congressional oversight to support and encourage this kind of stability.

CONCLUSION

Electricity generated by America's nuclear power plants over the past half-century has played a key part in our nation's growth and prosperity. Nuclear power produces over 20 percent of the electricity used in the United States today without producing air pollution. As our energy demands continue to grow in years to come, nuclear power should play an even greater role in meeting our energy and environmental needs.

The nuclear energy industry is operating its reactors safely and efficiently. The industry is striving to produce more electricity from existing plants. The industry is also developing more efficient, next-generation reactors and exploring ways to build them more cost-effectively.

The public sector, including the oversight committees of the U.S. Congress, can help maintain the conditions that ensure Americans will continue to reap the benefits of our operating plants, and create the conditions that will spur investment in America's energy infrastructure, including new nuclear power plants.

One important step is passage of comprehensive energy legislation that recognizes nuclear energy's contributions to meeting our growing energy demands, ensuring our nation's energy security and protecting our environment.

Equally important, however, is the need to ensure effective and efficient implementation of existing laws, like the Nuclear Waste Policy Act, and to provide federal agencies with the resources and oversight necessary to discharge their statutory responsibilities in the most efficient way possible.

The commercial nuclear power sector was born in the United States, and nations around the world continue to look to this nation for leadership in this technology and in the issues associated with nuclear power. Our ability to influence critical international policies in areas like nuclear nonproliferation, for example, depends on our ability to maintain a leadership role in prudent deployment, use and regulation of nuclear energy technologies here at home, in the United States, and on our ability to manage the technological and policy challenges—like waste management—that arise with all advanced technologies.

That is a broad responsibility and, in the case of nuclear energy, it rests equally on the shoulders of industry, government agencies like DOE and the NRC, and the appropriate committees of Congress.

Mr. Chairman, on behalf of NEI, I thank you for the opportunity to discuss nuclear energy's significant role in providing electricity to our nation today, and its vital importance as a clean, reliable and safe energy source for the future.